
Analysis of billfish landings made by small fresh tuna longline vessels operated from Sri Lanka during 2005 – 2009

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Abstract

The paper reviews the fish landings made by small fresh tuna longline vessels operated from Sri Lanka during 2005 – 2009 giving special emphasis to billfish landings. Small fresh tuna longline vessels are inboard engine boats having fish storage facilities, which may also have a Refrigerated Sea Water (RSW) system or Chilled Sea Water (CSW) system with some other modern equipment such as GPS and echo-sounder/fish finder. There are about thirty such tuna longline vessels being operated in Sri Lanka. These vessels normally target tuna and tuna-like species and operate either in the offshore waters within the EEZ of Sri Lanka or in the high seas. The fishery data used for this audit was mainly obtained from the catch records of the local fishing companies. The information includes the vessel name, number of individuals landed, weight and name of the species. Tuna is the key target species and has contributed around 60% of the total landings made by small fresh tuna longline vessels. Billfish which includes three species of marlins, one species of sailfish and one species of sword fish, have contributed over 30% of the total catch. This is a remarkably high proportion of the total catch when compared to the fish landings made by other Sri Lankan fishing vessels engaged in offshore or high sea fishing. However, a slight declining trend in the percentage of billfish landings (from 34% to 26%) was observed over the period. The key billfish species found in the landings is sword fish (*Xiphias gladius*). Surprisingly, this species has contributed over 75% to the total billfish landings. The study further revealed that small fresh tuna longline vessels operate differently from other fishing crafts engaged in multiday fishing in Sri Lanka.

Introduction

Sri Lanka is one of the most important fishing nations in the Indian Ocean. The fish are mainly caught from the sea and marine fish production was 332 000 Mt in 2010 (MFARD, 2012). Moreover, the production of the two subsectors, coastal and offshore/ deep sea was 202 000 Mt and 130 000 Mt respectively.

There are about 3 200 fishing boats engaged in multiday fishing activities. These vessels mostly operate in offshore waters within the EEZ of Sri Lanka or in the high seas. The fishing vessels engage in multiday fishing mainly target tuna. Tuna resources mainly comprises of Yellowfin tuna (*Thunnus albacares*), Big eye tuna (*Thunnus obsesus*), Skipjack tuna (*Katsuwonus pelamis*), Kawakawa (*Enthynnus affinis*), Frigate tuna (*Auxis thazard*) and Bullet tuna (*Auxis rochei*). But Kawakawa, Frigate tuna and Bullet tuna are mostly confined to coastal waters. Large pelagic fish like billfish, pelagic sharks and seer fish are also caught by multiday fishing vessels. The bulk of offshore and deep sea fish production mainly comprises of tuna and tuna-like fish. Sharks are considered as a by-catch species.

Gillnet is still the widely used fishing gear for catching tuna and tuna-like fish. Use of longlines for tuna fishery came into existence in Sri Lanka in the late 1950's but it could not be sustained due to the unavailability of suitable baits. Longlining for tuna was reintroduced to offshore and deep sea fisheries in late 1980's and few multiday boats used to practice that activity. Subsidies were also given for multiday boats to promote the longline fishing in the offshore waters. Gradually this has become successful for catching yellowfin tuna and at present, the longline alone accounts for more than 20% of the fishing effort in the multiday fishery. The longline has become a popular fishing gear today since it gives higher quality fish than gillnets.

Small fresh tuna longline vessels are inboard engine boats having fish storage facilities and which may also have a RSW (Refrigerated Sea Water) system or CSW (Chilled Sea Water) system, gear hauler, GPS, echo-sounder/fish finder and radio communications. The length of a vessel may be 15.2 - 18.3 m (50' - 60'). There are about thirty such vessels operating in Sri Lanka. Some fresh tuna longline vessels use satellite data together with historical catch data to find successful areas for fishing. These vessels normally target tuna and tuna like fish and operate either in the offshore waters within the EEZ of Sri Lanka or in the high seas. The catch is mainly exported to the Japanese sashimi market.



Figure 1. Small fresh tuna longline vessels operate in multiday fishing in Sri Lanka

Fishing operations

The small fresh tuna longline vessels operate throughout the year. Number of fishing trips per vessel per month is normally either one or two. In general, the trip duration is confined to 10 – 12 days. This is a considerably shorter period when compared with the trip duration of other Sri Lankan vessels operating in offshore and high seas. The small trip duration has helped to produce good quality fish for fresh sashimi market in Japan.

Target species and catch composition

The key target species of the small fresh tuna longliners is yellowfin tuna. Other tuna species like big eye tuna are also caught. Tuna has contributed over 60% of the total landings made by fresh tuna longliners (Figure 2). The other important group of fish targeted by fresh tuna longliners is billfish. Billfish has contributed over 30% to the total landings. Percentage contribution of billfish is considerably higher for 2005 and 2006 years (about 34% of the total landings) (Figure 2). Percentage contribution of billfish has shown a slight declining trend over the period. Other species are mainly Sharks, Rays, Butter fish and Dolphin fish etc. These species are non-target species and the relative proportion of them has also been declining.

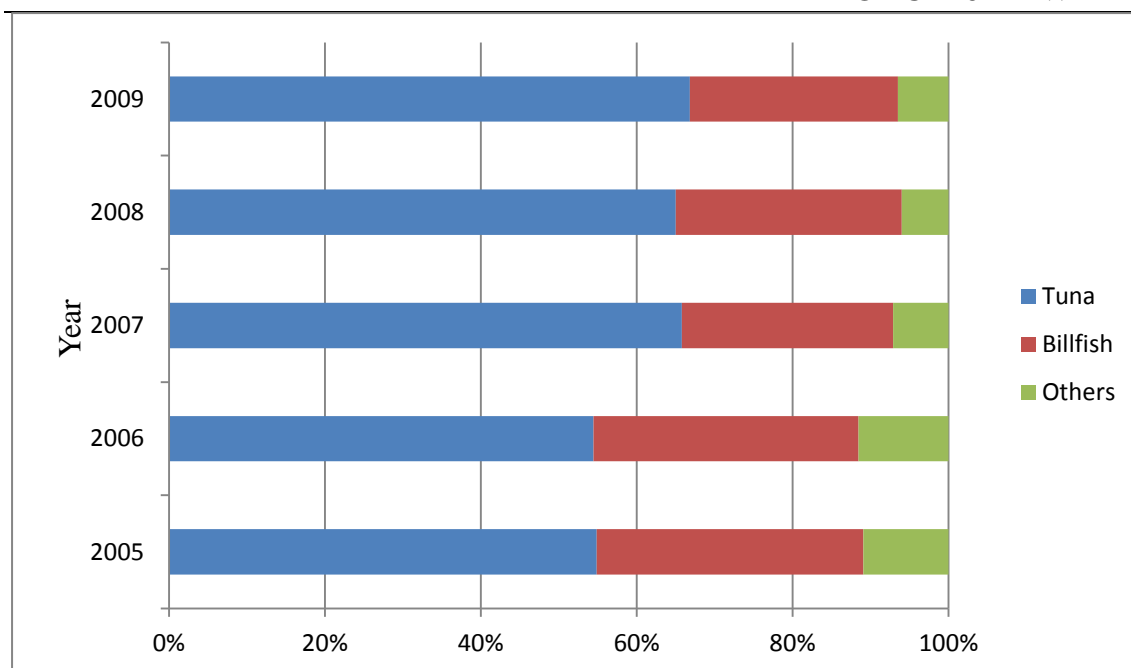


Figure 2. Relative contribution of tuna, billfish and other species in small fresh tuna longline landings: 2005 - 2009

Billfish catch comprises of three species of marlins, one species of sailfish and one species of sword fish. The three species of marlins are Indo-Pacific Blue Marlin (*Makaira mazara*), Black Marlin (*Makaira indica*) and Striped Marlin (*Tetrapturus audax*). The single species of Sailfish and the species of Swordfish found in billfish catches are Indo-Pacific Sailfish (*Istiophorus platypterus*) and Swordfish (*Xiphias gladius*) respectively. The billfish catch is dominated by Swordfish landings and this species has contributed over 75% to the total billfish landings (Figure 3). However, Swordfish landings as a percentage of the total billfish landings have been declining. In 2005, Swordfish contributed over 90% to the Billfish landings. But, in 2009, it has declined up to 70% of the billfish landings. In the meantime, marlin landings have been considerably growing and marlin has contributed nearly 30% to the Billfish landings in 2009. Since the catch of the three species of marlins are considered as a single category, it is difficult to understand which species of marlin has been caught more.

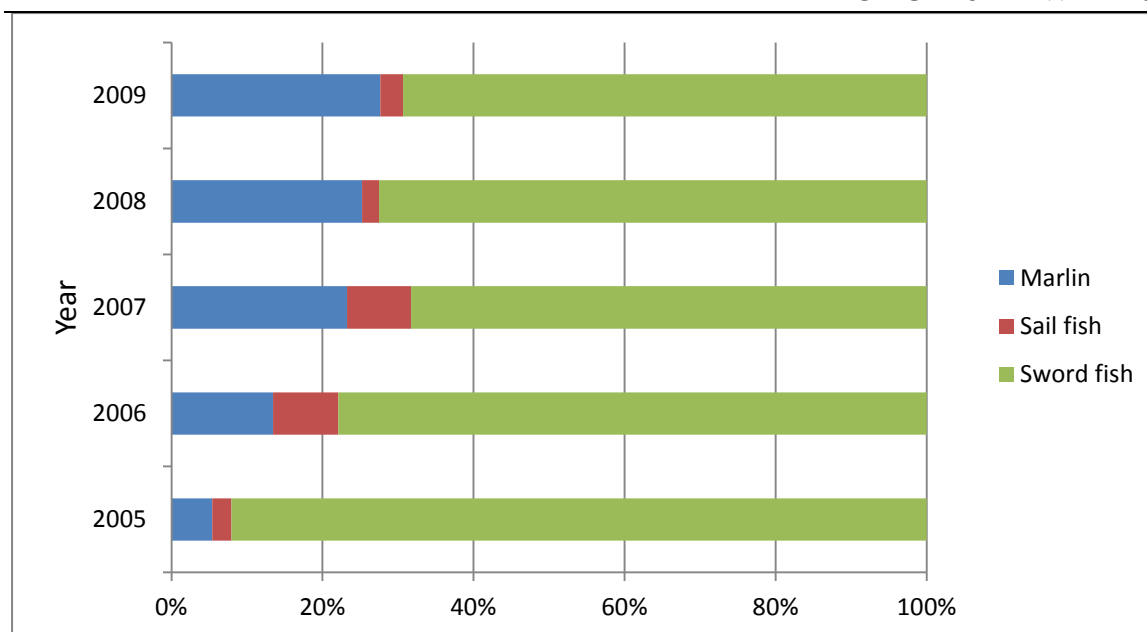


Figure 3. Relative contribution of Marlin, Sailfish and Swordfish in fresh tuna longline landings: 2005 – 2009

Trends in fresh tuna longline landings

Tuna has mainly contributed to the total catch of the small fresh tuna longline vessels followed by billfish. Also, percentage contribution of tuna has shown a slight increasing trend over the period. Even though, billfish has contributed more than 30% of the total landings, a declining trend in the percentage of billfish landings (from 34% to 26%) was observed for the period (Figure 2). Also, even though swordfish was the major contributor to total billfish landings, the relative contribution of swordfish has declined from 92% to 70% of the total billfish landings (Figure 3).

There is a seasonal variation in the relative catch of the dominant groups (Figure 4). In general, proportion of the billfish catch is relatively higher in the 4th quarter (except in 2005) than other quarters of the year. The relative landing of tuna is always higher than billfish throughout the year.

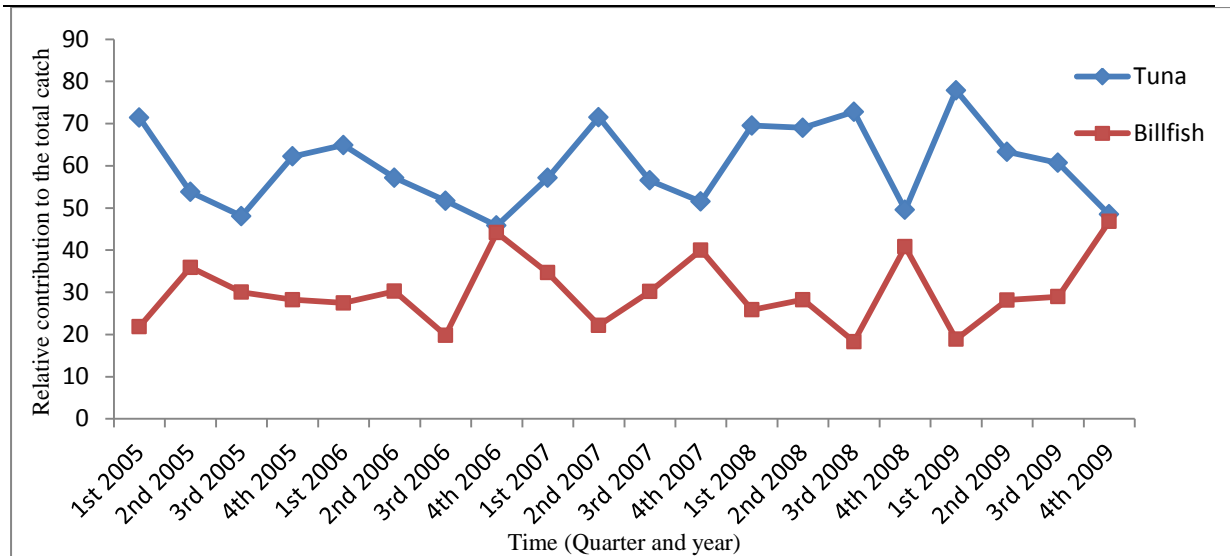


Figure 4. Quarterly variation in the relative landings of tuna and billfish made by fresh tuna longline vessels

There is no clear trend in the average weight of an individual fish of marlin or sailfish or swordfish (Figure 5). The highest average individual fish weight was reported in 2007 for marlin and sailfish whereas the lowest average individual fish weight was reported in the same year for swordfish.

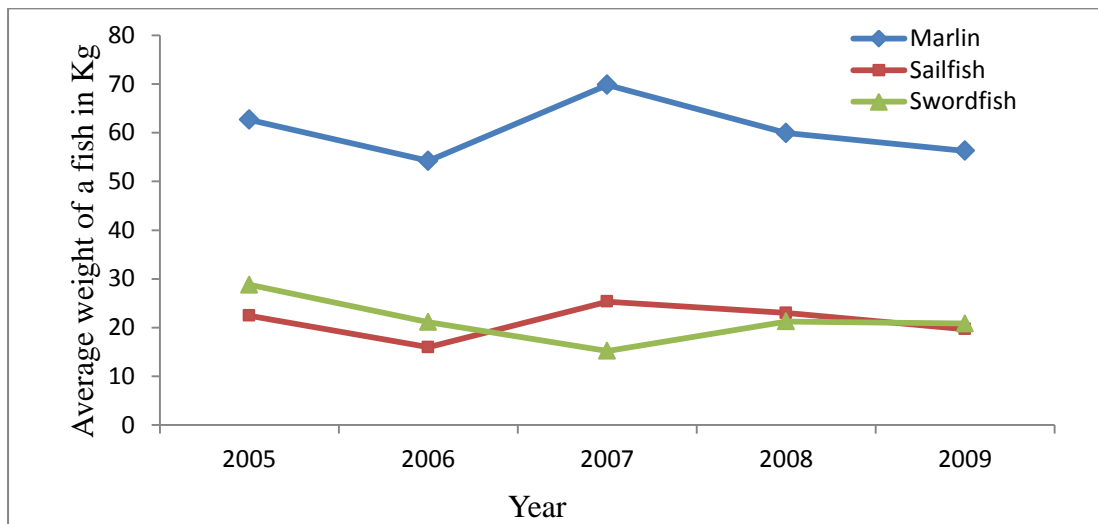


Figure 5. Average individual fish weight of marlin, sailfish and swordfish caught by small fresh tuna longline vessels: 2005 – 2009

Comparison of small fresh tuna longliners with other multiday fishing vessels operated for tuna and tuna-like fish

Multiday fishing vessels of Sri Lanka mostly target tuna and tuna-like fish. Small fresh tuna longline vessels also target tuna and tuna-like fish. The popular fishing gear used by Sri Lankan multiday fishing vessels are gillnets and longlines. The gillnet-longline gear combination is also being frequently used in multiday fishing. The fish landings made by multiday fishing crafts operated with above gears for the period of 2006 – 2010 have been observed by Haputhantri and Maldeniya (2011). According to their observations, tuna has significantly contributed to the total catch (66% of the total catch of gillnets, 48% of the total catch of gillnet- longline combination and 78% of the total catch of longlines). Also, Billfish has contributed 7%, 18% and 11% of the total fish caught by above fishing gears respectively. However, as per the present study, over 30% of the total landings made by small fresh tuna longliners are billfish. This is a remarkably high proportion of the total landings compared to the billfish landed by other vessels engaged in multiday fishing in Sri Lanka. Apart from this, there is a considerable variation in the billfish landings in terms of major billfish species/ groups between small fresh tuna longliners and other multiday fishing boats. As noted above, more than 75% of the total billfish landed by small fresh tuna longliners are swordfish. However, as per Haputhantri and Maldeniya (2011), marlins have dominated the billfish catch, followed by sailfish. But, a substantial proportion of swordfish had not been reported.

A considerable difference could be observed in terms of fishing operations between small fresh tuna longliners and traditional tuna longliners operated from Sri Lanka (Table 1). But, there are few similarities too between the two boat types. Both types of vessels operate throughout the year and there may be either one or two fishing trips per vessel per month. All though the trip duration of a small fresh tuna longline vessel is confined to 10- 12 days, the trip duration of a traditional tuna longline vessel may be 15 – 30 days. The number of hooks used in a traditional longline vessel varies from 200-600. The average hooking depth may vary from 40 m to 100 m. However, small fresh tuna longliners use 1000 - 1200 hooks per operation and the hooking depth of these vessels could also be sometimes even higher than above depth range.

Table 1. A comparison of traditional tuna longline vessels and small fresh tuna longline vessels

Traditional Tuna longline vessels	Small fresh tuna longline vessels
Operate throughout the year	Operate throughout the year
No. of fishing trips of a vessel per month – 1	No. of fishing trips of a vessel per month – 1 or 2
Trip duration – 15 - 30 days	Trip duration - 10 – 12 days
Use 200-600 hooks	Use 1000 - 1200 hooks
Hooking depth - 40 m to 100 m	Hooking depth – may be even higher than 100 m

Conclusion

Small fresh tuna longline vessels operate differently from other fishing crafts engaged in multiday fishing in Sri Lanka. In addition, small fresh tuna longline vessels catch higher proportion of billfish (over 30%) than other vessels engaged in multiday fishing. There is a considerable difference in terms of target billfish species/ groups too, between small fresh tuna longliners and the vessels operated in multiday fishing targeting tuna and tuna-like fish. Small fresh tuna longliners frequently catch swordfish whereas other multiday fishing vessels mainly catch marlins and sailfish. A strong seasonal variation in the major groups caught by small fresh tuna longliners (i.e. tuna and billfish) was observed.

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